

1 **Remarks for the "RESPONSE TO FINAL OFFICE
2 ACTION DATED 7/13/2005 UNDER 37 C.F.R. § 1.116"**

3 Applicant respectfully requests entry of the following remarks and
4 reconsideration of the subject application. Applicant respectfully requests entry of
5 the amendments herein. The remarks and amendments should be entered under 37
6 C.F.R. §1.116 as they place the application in better form for appeal, or for
7 resolution on the merits.

8 Applicant respectfully requests reconsideration and allowance of all of the
9 claims of the application. Claims 1-42 and 45-46 are presently pending. Claims
10 amended herein are none. Claims withdrawn or cancelled herein are none. New
11 claims added herein are none.

12
13 **Formal Request for an Interview**

14 If the Office's response to this communication is anything other than
15 allowance of all pending claims, then Applicant formally requests an interview
16 with the Examiner of the present patent application. Applicant asks the Examiner
17 to call and/or email the undersigned attorney for the Applicant to schedule a
18 convenient date and time for a telephone interview. The undersigned attorney is in
19 the west coast, therefore can typically be found in his office from about 12pm until
20 7pm (Eastern Time) from Monday through Friday.
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Serial No.: 09/847,535
Atty Docket No.: MS1-665us
RESPONSE TO FINAL OFFICE ACTION DATED
7/13/2005 UNDER 37 C.F.R. § 1.116

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atty: Kasey C. Christie

Substantive Claim Rejections

Claim Rejections under §§ 102 and 103

The Office rejects all of the pending claims (1-42 and 45-46) under §102 and/or §103. For the reasons set forth below, the Office has not shown that one or more of the cited references anticipate the rejected claims. For the reasons set forth below, the Office has not made a *prima facia* case showing that the rejected claims are obvious (under §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon the following references:

- **Scalzi:** *Scalzi et al.*, US Patent No. 5,560,013 (issued 9/24/1996);
- **Franz:** Michael Franz, "Emulating an Operating System on Top of Another" Software – Practice and Experience. Vol. 23, No. 6, June 1993, pp. 677-692);
- **Duvall:** *Duvall et al.*, US Patent No. 4,742,447 (issued 5/3/1988);
- **McCoy:** *McCoy et al.*, US Patent No. 5,036,484 (issued 7/30/1991).

Overview of the Application

The Application describes a technology facilitating the operation of non-native program modules within a native computing platform. More particularly, it describes a technology facilitating the interoperability of native and non-native program modules within a native computing platform.

Specifically, this technology involves an emulation of the kernel of the non-native operating system. Instead of interacting with the native kernel of the native computing platform, the non-native program modules interact with a non-native

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1 kernel emulator. This emulator handles the necessary conversions and translations.
2 With this non-native kernel emulation, native and non-native program modules are
3 interoperable. Except for the kernel emulator, none of the program module (native
4 or non-native) and none of the other portions of the native computing platform are
5 aware of the emulation. The computing environment and other program modules
6 appear to be non-native to the non-native program modules. Likewise, the non-
7 native program modules appear to be native to the computing environment and the
8 native program modules.

9

10 **Cited References**

11 The Office cites **Scalzi** as its reference for is anticipation-based rejections
12 and the primary references in many of its obviousness-based rejections. The
13 Office cites **Duvall** as its primary reference for some of its obviousness rejections
14 and a secondary reference in other obviousness-based rejections. In addition, the
15 Office cites **Franz** and **McCoy** as secondary references in some of its
16 obviousness-based rejections.

17

18 **Scalzi**

19 **Scalzi** describes a method of utilizing large virtual addressing in a target
20 computer to implement an instruction set translator (IST) for dynamically
21 translating the machine language instructions of an alien source computer into a
22 set of functionally equivalent target computer machine language instructions,
23 providing in the target machine, an execution environment for source machine
24 operating systems, application subsystems, and applications.

1 The target system provides a unique pointer table in target virtual address
2 space that connects each source program instruction in the multiple source virtual
3 address spaces to a target instruction translation which emulates the function of
4 that source instruction in the target system. The target system stores the translated
5 executable source programs by actually storing only one copy of any source
6 program, regardless of the number of source address spaces in which the source
7 program exists.

8 The target system manages dynamic changes in the source machine storage,
9 accommodating the nature of a preemptive, multitasking source operating system.
10 The target system preserves the security and data integrity for the source programs
11 on a par with their security and data integrity obtainable when executing in source
12 processors (i.e., having the source architecture as their native architecture). The
13 target computer execution maintains source-architected logical separations
14 between programs and data executing in different source address spaces--without a
15 need for the target system to be aware of the source virtual address spaces.

16
17 Duvall

18 Duvall describes a method for accessing information in a page segmented
19 virtual memory data processing system in which virtual machines running UNIX
20 type operating systems are concurrently established, and in which a memory
21 manager controls the transfer of information between primary and secondary
22 storage devices in response to the occurrence of page faults. The method
23 establishes a plurality of data structures in a dynamic manner in response to a
24 Supervisor call to "map" a file.

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1 The mapping process assigns a new segment of virtual memory to the
2 mapped file and correlates, in one data structure, the virtual address of each page
3 of data in the new segment to a disk file address where that page is actually stored.
4 A UNIX system call by an application program for a specific virtual page is
5 handled by the page fault handler, and not the UNIX kernel, since the application
6 can supply the real address of the page on the disk file from the data structure that
7 was created by the mapped page range Supervisor call. Simple load and store type
8 of instructions are employed for the data transfer, which avoids much of the
9 overhead that normally accompanies conventional UNIX read and write system
10 calls to the storage subsystem.

11

12 Franz

13 As its name implies, **Franz** discusses the emulation of one operating
14 system on top of another operating system. **Franz** describes the design of an
15 operating-system emulator. This software interface provides the services of one
16 operating system (e.g., Oberon) on a machine running a different operating system
17 (e.g., Macintosh), by mapping the functions of the first onto equivalent calls to the
18 second.

19

20 McCoy

21 **McCoy** describes a system for emulating the operation of a terminal
22 connected to a host computing system while retaining the ability to utilize personal
23 computer application programs resident in the personal computer by utilizing a
24 personal computer/host terminal emulation program which conducts an analysis of

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host data and keystrokes to identify personal computer commands and calls the appropriate resident application program in response to such commands.

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Anticipation Rejections

Anticipation Rejections Based upon Scalzi

The Office rejects claims 1, 3-6, 9-13, 15-17, 19-28, 34, 37-40, 42, and 45-46 under USC § 102(b) as being anticipated by **Scalzi**. Applicant respectfully traverses the rejections of these claims. Based on the reasons given below, Applicant asks the Office to withdraw its rejections of these claims.

Claims 1, 3, 4, 13, 15, 16, 34, 40, and 45

In the Action, the Office provides the following reasoning for rejecting these claims:

2. **Claims 1,3-6,9-13,15-17,19-28, 34,37-40,42,45-46** are rejected under 35 U.S.C. 102(b) as being anticipated by Scalzi et al (U.S. Patent Number 5,560,013), herein referred to as **Scalzi**.
3. As to **Claims 1,3,4,13,15,16,34, 40 and 45**, Scalzi teaches: a kernel emulator for non-native program modules, the emulator comprising: an interceptor configured to intercept kernel calls from non-native program modules (**Figure 1, element 102 and description**); a call-converter configured to convert non-native kernel calls intercepted by the interceptor into native kernel calls (**Figure 1, element 103 and description**); wherein the call-converter comprises: an instruction-translator configured to translate non-native CPU instructions into native CPU instructions (**Figure 1, element 103 and description**); an address-translator configured to translate addresses from non-native length into native length (**Figure 3 and description, column 21, lines 42-48**).

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1 In a response to the previous non-final Office action dated 11/30/2004
2 ("NON-FINAL ACTION"), Applicant indicated that all of these rejected claims
3 recite kernel emulation¹ and operating on or in response to kernel calls. Applicant
4 submitted and again submits that while Scalzi does appear to disclose instructions
5 conversion, it fails to disclose kernel emulation, kernel calls, and interception of
6 such kernel calls.

7 More specifically, Scalzi never discloses a call to a kernel of an operating
8 system and never discloses emulating a kernel of an operating system. Also,
9 Scalzi never even mentions a kernel of an operating system. As part of that
10 response, Applicant noted that many of these claims² recite an interception of a
11 kernel call. Since Scalzi never mentions kernel calls, it is logical that it never
12 discloses intercepting such calls.

13 In its final Office action dated 7/13/2005 ("NON-FINAL ACTION"), the
14 Office proposed (on pp. 2-3) that Scalzi inherently and inferentially discloses
15 kernel emulation and operating on or in response to kernel calls. More
16 specifically, the Office indicated the following:

17 7. Applicants are thanked for addressing this issue. Applicants state the Scalzi
18 (U.S. Patent 5,560,013 (1996)) reference doesn't disclose kernel of an operating
19 system. According to Microsoft Press Computer User's Dictionary, 1998 edition, a
kernel is defined (pg. 201) as *the core of an operating system—the portion of the*
20 *system that manages memory, files and peripheral devices; maintains the time and*
21 *date; launches application; and allocates system resources.* Scalzi defines the core
22 *operating systems as the "target system" that is defined (abstract) as efficiently stores*
23 *the translated executable source programs by actually storing only one copy of any*

24 ¹ E.g., "kernel emulator" in claims 1, 40 and 45, "emulating a kernel" in claim 13, and "emulating
a non-native kernel" in claim 34

25 ² E.g., independent claims 1, 13, and 45



source program, regardless of the number of source address spaces in which the source program exists. The target system efficiently manages dynamic changes in the source machine storage, accommodating the nature of a preemptive, multitasking source operating system. The target system preserves the security and data integrity for the source programs on a par with their security and data integrity obtainable when executing in source processors (i.e. having the source architecture as their native architecture). The target computer execution maintains source-architected logical separations between programs and data executing in different source address spaces—without a need for the target system to be aware of the source virtual address spaces. Summarily, both terms are defined as the managing source of the computer (highlight emphasized), thus equating the same purpose.

Applicants state Scalzi doesn't disclose interception of a kernel call or kernel emulation. Based on the latter analysis of equivalence between kernel and target system examiner argues the kernel call as inherent for the simple reason that if a translation function is an event between nativity and non-native functions then a call is understood as an integral part to the translation function (Scalzi: column 5, lines 9-11, "instruction translation"; column 5, lines 38-40). Base on the previous analysis, the rejection stands.

Applicant maintains its position that Scalzi never discloses (directly, inferentially, or inherently) a call to a kernel of an operating system and never discloses emulating a kernel of an operating system. Instead, Scalzi discloses a "machine" emulator and instruction "translator."

The subject-matter of one or more of these claims (e.g., claim 1) recites an emulation of a non-native kernel (of a non-native operating system) so that non-native programs may operate on a computer with a "native" kernel (of a "native" operating system). However, Scalzi never discloses this.

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Atty Docket No.: MS1-665us
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7/13/2005 UNDER 37 C.F.R. § 1.116

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PAGE 26/37 * RCVD AT 11/14/2005 6:55:33 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/31 * DNIS:2738300 * CSID:15093238979 * DURATION (mm:ss):09:40

1 Applicant submits that instead of disclosing "kernel" emulation (which is
2 the subject matter of the rejected claims), Scalzi discloses "machine" emulation
3 or, put another way, emulation of a "computing hardware architecture."

4 The difference between "hardware" and "kernel" emulation is more than a
5 mere distinction. The difference has real and practical considerations.

6 Now, distinguishing between the two types of emulation is a bit confusing.
7 That is because the "kernel" and "hardware" are interrelated in a "computing
8 platform." Indeed, p. 1, lines 20-21 of the Application notes the following: "A
9 computing platform typically includes an operating system (OS) [of which the
10 kernel is part thereof] and [a] computing hardware architecture."

11 Since the kernel is layered on-top of the hardware, changes to the hardware
12 typically necessitate changes to the kernel. However, the opposite is not true. The
13 kernel may be changed and re-organized without necessitating a change to the
14 hardware.

15 For example, the Application describes the concepts of virtual machines
16 (VMs) on pp. 7-8 of the Application and illustrated in Fig. 2. The VM emulates
17 the non-native hardware layer 250 in software. To run non-native applications
18 (such as 212a and 212b) within a VM, a non-native kernel runs on top of the
19 emulated non-native hardware layer 250. These three are executed solely in
20 software in a segregated "box" 200. There are other possible arrangements for a
21 VM other than what is shown in Fig. 2. For example, some or all of the VM
22 components may be implemented within the native kernel 130.

23 Applicant submits that Scalzi performs hardware emulation or more
24 particularly a variation of a VM. Scalzi primarily performs this hardware
25 emulation by two mechanisms: a large virtual addressability scheme (which is the

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1 subject of U.S. Patent Application Serial No. 08/349,771, which matured into U.S.
2 Patent No. 5,577,231) and binary translation of instructions. Col. 1, lines 35-40 of
3 Scalzi defines binary translation, but in short, it is a technique for automatically
4 converting the machine instructions—instruction by instruction—of one
5 computing platform to those of another. Note, that this involves the translation of
6 “machine instructions” and not kernel calls.

7 As shown above, Scalzi does not disclose all of the claimed elements and
8 features of these claims. Accordingly, Applicant asks the Office to withdraw its
9 rejection of these claims.

10

11 Claims 2-12

12 These claims ultimately depend upon independent claim 1. As discussed
13 above, claim 1 is allowable.

14 In addition to its own merits, each of these dependent claims is allowable
15 for the same reasons that its base claim is allowable. Applicant submits that the
16 Office withdraw the rejection of each of these dependent claims because its base
17 claim is allowable.

18 Moreover, Applicant submits that Scalzi discloses conversion of a
19 “machine” instruction and that is not equivalent to translation of kernel calls.

20

21 Claims 14-28

22 These claims ultimately depend upon independent claim 13. As discussed
23 above, claim 13 is allowable.

1 In addition to its own merits, each of these dependent claims is allowable
2 for the same reasons that its base claim is allowable. Applicant submits that the
3 Office withdraw the rejection of each of these dependent claims because its base
4 claim is allowable.

5

6 Claims 35-39

7 These claims ultimately depend upon independent claim 34. As discussed
8 above, claim 34 is allowable.

9 In addition to its own merits, each of these dependent claims is allowable
10 for the same reasons that its base claim is allowable. Applicant submits that the
11 Office withdraw the rejection of each of these dependent claims because its base
12 claim is allowable.

13

14 Claims 41 and 42

15 These claims ultimately depend upon independent claim 40. As discussed
16 above, claim 40 is allowable.

17 In addition to its own merits, each of these dependent claims is allowable
18 for the same reasons that its base claim is allowable. Applicant submits that the
19 Office withdraw the rejection of each of these dependent claims because its base
20 claim is allowable.

21

22 Claim 46

23 This claim ultimately depends upon independent claim 45. As discussed
24 above, claim 45 is allowable.

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atty: Kasey C. Christe

In addition to its own merits, this dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of this dependent claim because its base claim is allowable.

Obviousness Rejections

Lack of *Prima Facie* Case of Obviousness (MPEP § 2142)

Applicant disagrees with the Office's obviousness rejections. Arguments presented herein point to various aspects of the record to demonstrate that all of the criteria set forth for making a *prima facie* case have not been met.

Based upon Scalzi and Franz

The Office rejects claims 2 and 14 under USC § 103(a) as being unpatentable over **Scalzi** in view of **Franz**. Applicant respectfully traverses the rejection of this claim. Applicant asks the Office to withdraw its rejection of this claim.

Claims 2 and 14

Claim 2 ultimately depends upon independent claim 1. As discussed above, claim 1 is allowable. Claim 14 ultimately depends upon independent claim 13. As discussed above, claim 13 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the

1 Office withdraw the rejection of each of these dependent claims because its base
2 claim is allowable.

3

4 **Based upon Scalzi and Duvall**

5 The Office rejects claims 7, 8, 18, 35, and 41 under USC § 103(a) as being
6 unpatentable over Scalzi in view of Duvall. Applicant respectfully traverses the
7 rejection of this claim. Applicant asks the Office to withdraw its rejection of this
8 claim.

9

10 **Claims 7, 8, 18, 35, and 41**

11 Claims 7 and 8 ultimately depend upon independent claim 1. As discussed
12 above, claim 1 is allowable. Claim 18 ultimately depends upon independent claim
13. As discussed above, claim 13 is allowable. Claim 35 ultimately depends upon
14 independent claim 34. As discussed above, claim 34 is allowable. Claim 41
15 ultimately depends upon independent claim 40. As discussed above, claim 40 is
16 allowable.

17 In addition to its own merits, each of these dependent claims is allowable
18 for the same reasons that its base claim is allowable. Applicant submits that the
19 Office withdraw the rejection of each of these dependent claims because its base
20 claim is allowable.

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atty: Kasey C. Christie

1 **Based upon Duvall and McCoy**

2 The Office rejects claims 29-33 under USC § 103(a) as being unpatentable
3 over **Duvall** in view of **McCoy**. Applicant respectfully traverses the rejection of
4 this claim. Applicant asks the Office to withdraw its rejection of these claims.

5

6 **Claim 29**

7 In the Action, the Office provides the following reasoning for rejecting this
8 claim:

9

10 29. **Claims 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over**
11 **Duvall and further in view of McCoy et al (U.S. Patent Number 5,036,484), herein**
12 **referred to as McCoy.**

13 30. **As to Claim 29, Duvall teaches: a method comprising: if the initiating program**
14 **is non-native: limiting available memory to a range that is addressable by the non-native**
15 **program module (column 4, lines 43-46, column 6, lines 25-29, column 9, lines 20-**
16 **25); establishing non-native a version of a shared memory data structure that may be**
17 **synchronized with a native version of the same shared memory data structure (column**
18 **5, lines 45-51, column 6, lines 25-29).**

19 31. **Duvall further teaches the data in a segment of virtual memory is created as a**
20 **result of an application program being run (column 5, lines 52-55). While this implies**
21 **that must be some determination as to weather a program is native or non-native**
22 **allowing for the segment in virtual memory to be created, Duvall does not expressly**
23 **teach determining whether an initiating program module is a native or non-native.**

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1 32. McCoy teaches determining whether an initiating program module is a native or
2 non-native (Figure 3a, element 36a, column 5, lines 40-48) in a system that emulates
3 a host program in a PC environment and translates host data to PC format by the
4 emulation program (column 5, lines 28-31), allowing the system to know whether to
5 perform a function of the native system or perform a function of the non-native system
6 which includes the translation of code (Figure 3a, element 31a and column 5, lines
7 40-48) since in the emulation systems of the prior art, when operating in emulation
8 mode, the native system is incapable of performing functions other than those of the
9 terminal which is being emulated. Therefore, the functions of the personal computer are
not available in the emulation mode (column 1, lines 32-39).

10 It would have been obvious to one of ordinary skill in the art at the time the invention
11 was made to modify since it would be advantageous to use McCoy to modify Duvall
12 since a proliferation of many software programs has led to a lack of uniformity in the
13 way in which data is formatted...and the presence of functions or operations which are
14 unique to each program (column 1, lines 45-50), despite the fact that processors are
15 operating at ever increasing speeds and efficiencies...nevertheless there's a finite delay
16 between the time the operator request a document for conversion processing (column
17 2, lines 45-50).

18 Duvall discloses virtual machine (VM) technology, which the Applicant
19 discusses in its Background section on p. 7 and 8 of the Application. Duvall
20 discloses a new addressing scheme for VMs to use to read/write from/to a "file"
21 (rather than memory). Duvall does not disclose "limiting available memory to a
22 range that is addressable." Rather, it discloses a re-definition and re-arrangement
23 of the meaning of the bits in the existing and unmodified addressable range.

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1 In the response to the NON-FINAL ACTION, Applicant amended this
2 claim in the following manner to make it clear that the "limiting" has the effect of
3 reducing the range of available memory that a non-native program module may
4 address:

5 limiting available memory to a range that is addressable by the non-native
6 program module, that range of addressable memory being less than the available
7 memory

8
9 Applicant submits that this above-identified amended language (which as
10 was added in the the response to the NON-FINAL ACTION) has not been
11 examined herein. The Office makes not reference in this Action to this amended
12 language and has cited nothing in any reference which discloses this language.

13 Moreover, the Office has not identified where Duvall discloses "non-
14 native" program modules. Indeed, since Duvall discloses a VM model, then all
15 program modules operating under a particular VM are presumptively native to that
16 VM. If not, then an emulator would be necessary, but Duvall does not disclose an
17 emulator.

18 While McCoy does disclose a nominal "emulator," it is not an emulation
19 related to program modules being considered native or non-native. Rather,
20 McCoy discloses a terminal emulation—that is, emulation of the operation of a
21 "dumb" terminal connected to a host computer (e.g., mainframe computer).

22 The Office indicates the McCoy discloses an initiation of a program
23 module based upon a determination of whether a program is native or non-native.
24 It points to col. 5, lines 40-48, Fig. 3a, element 36a, which is reproduced here:
25



1 Keystrokes on the keyboard/display 35a are examined by
2 the keystroke interpretation portion 36a of the emulation program
3 to determine whether a PC or a host function is required. Program
4 block 36a is responsive to the selected mode. In the PC mode, the
5 keystrokes are handled by block 37a as normal keyboard
6 commands or data. In the emulation mode, the keystrokes
7 representing the host keys are passed to the host processor via the
8 host emulator 31a.

9 However, this particular cited portion (and McCoy as a whole) are focused
10 on determining from whence input (e.g., keystrokes) is received and processing
11 them accordingly. The first sentence of the passage above says, "Keystrokes...are
12 examined...to determine whether a PC or a host function is required." Applicant
13 respectfully submits that this is not equivalent to "determining whether an
14 initiating program module is a native or non-native."

15 Indeed, Applicant submits that all of McCoy's program modules (include
16 the McCoy's terminal emulation program itself) are presumptively native. If they
17 were non-native, then they would not function on the PC absent an operating-
18 system based emulation program. However, McCoy does not disclose such an
19 emulation program.

20 For the reasons given above, Applicant submits the combination of Duvall
21 and McCoy fail to disclose all of the elements and features of this claim.
22 Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

23 *No Motivation to Combine References*

24 Furthermore, Applicant asserts that there is no motivation to combine the
25 teachings of Duvall and the teachings of McCoy.



1 As discussed above, Duvall describes an addressing scheme for accessing
2 files in a VM environment. However, McCoy describes "dumb" terminal
3 emulation on a PC.

4 Applicant submits that there is no suggestion, teaching, or reason given by
5 one reference that would motivate one of ordinary skill in the art at the time of the
6 invention (hereinafter, "OOSA") to combine it with the teachings of the other
7 reference. More importantly, Applicant submits that the Office has not provided
8 any objective evidence showing why OOSA would be motivated to combine the
9 teachings of the two references.

10 Duvall says nothing that would motivate OOSA to look towards Chipman
11 and combine their teachings. Likewise, McCoy says nothing that would motivate
12 OOSA to look towards Duvall and combine their teachings..

13 Accordingly, Applicant submits that OOSA would not be motivated to
14 combine the VM file-access I/O addressing scheme of Duvall with the "dumb"
15 terminal emulation of McCoy. Accordingly, Applicant asks the Office to
16 withdraw its rejection of this claim.

17
18 Claims 30-33

19 These claims ultimately depend upon independent claim 29. As discussed
20 above, claim 29 is allowable.

21 In addition to its own merits, each of these dependent claims is allowable
22 for the same reasons that its base claim is allowable. Applicant submits that the
23 Office withdraw the rejection of each of these dependent claims because its base
24 claim is allowable.

1 **Dependent Claims**

2 In addition to its own merits, each dependent claim is allowable for the
3 same reasons that its base claim is allowable. Applicant submits that the Office
4 withdraw the rejection of each dependent claim where its base claim is allowable.
5

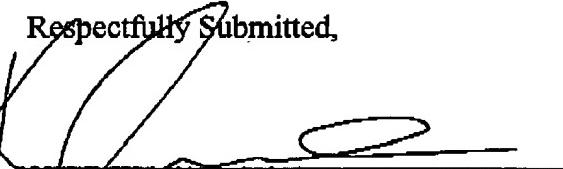
6 **Conclusion**

7 All pending claims are in condition for allowance. Applicant respectfully
8 requests reconsideration and prompt issuance of the application. If any issues
9 remain that prevent issuance of this application, the Office is urged to contact the
10 undersigned attorney before issuing a subsequent Action.

11

12 Respectfully Submitted,

13 By:

14 
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Serial No.: 09/847,535
Atty Docket No.: MS1-665us
RESPONSE TO FINAL OFFICE ACTION DATED
7/13/2005 UNDER 37 C.F.R. § 1.116

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Atty: Kasey C. Christie